WHAT IS CLAIMED IS:

1. A system for effectively managing operating power for an electronic device, comprising:

a battery pack coupled to said electronic device for supplying said operating power to said electronic device; and

a battery controller configured to alternately manage said battery pack in one of a single-cell implementation and a dual-cell implementation, said battery controller including a charge pump to provide an internal controller power supply for operating said battery controller in said single-cell implementation.

2. The system of claim 1 wherein said battery controller is implemented as a single integrated circuit device that is selectively configurable to operate in either said single-cell implementation or said dual-cell implementation of said battery pack.

3. The system of claim 1 wherein said electronic device is implemented as a portable electronic camera device that obtains said operating power from said battery pack, said battery controller providing remaining operating power information regarding said battery pack to said portable electronic camera device.

4. The system of claim 1 wherein said single-cell implementation of said battery pack utilizes a single lithium-ion battery cell, and wherein said dual-cell implementation of said battery pack utilizes two lithium-ion battery cells.

5. The system of claim 1 wherein said battery pack provides a reduced supply voltage to said battery controller in said single-cell implementation, said charge pump responsively increasing said reduced supply voltage in said single-cell implementation to thereby produce said internal controller power supply for powering said battery controller, said internal controller power supply thus being approximately equal in both said single-cell implementation and said dual-cell implementation, said charge pump selectably manipulating said reduced supply voltage by either a unity amplification factor, a 1.5 amplification factor, or times-two amplification factor, depending upon how much said reduced supply voltage needs to be increased to adequately provide said internal controller power supply.

6. The system of claim 1 wherein said battery pack has zero microamps of leakage current in a shutdown mode in which said battery pack has been discharged to a pre-determined threshold voltage level.

7. The system of claim 1 wherein said battery pack includes a charge switch and a discharge switch that are connected in a series configuration between a battery charger and one or more battery cells of said battery pack, said charge switch being opened by a CPU of said battery controller to prevent an overcharge condition in said battery cells.

8. The system of claim 1 wherein said battery pack includes a charge switch and a discharge switch that are connected in a series configuration between a battery charger and one or more battery cells of said battery pack, said discharge switch being openable by a CPU of said battery controller to prevent an overdischarge condition in said battery cells.

9. The system of claim 1 wherein said battery pack includes a charge switch and a discharge switch that are connected in a series configuration between a battery charger and one or more battery cells of said battery pack, said battery controller including an internal negative charge pump that generates a negative charge pump output voltage to a charge amplifier and a discharge amplifier that may then each generate a sufficient enhancement voltage to fully turn on a corresponding one of said charge switch and said discharge switch.

10. The system of claim 9 wherein said internal negative charge pump includes a first phase-1 switch and a second phase-1 switch that are closed to charge a capacitor with a charge pump output voltage from said charge pump, said internal negative charge pump subsequently closing a first phase-0 switch and a second phase-0 switch to provide said negative charge pump output voltage from said internal negative charge pump to both said charge amplifier and said discharge amplifier.

11. The system of claim 1 wherein said battery pack includes a charge switch and a discharge switch that are connected in a series configuration between a battery charger and one or more battery cells of said battery pack, said charge switch and said discharge switch being implemented as P-channel field-effect transistors that are located in a positive charge path between said battery charger and said one or more battery cells of said battery pack.

12. The system of claim 1 wherein said battery pack includes a charge switch and a discharge switch that are connected in a series configuration between a battery charger and one or more battery cells of said battery pack, said charge switch and said discharge switch being implemented as N-channel field-effect transistors that are located in a negative charge path between said battery charger and said one or more battery cells of said battery pack.

13. The system of claim 1 wherein said battery pack is implemented in said single-cell implementation, said battery controller coordinating a startup procedure for said battery pack during which a battery charger is connected to said battery pack in a discharged state, said battery controller responsively closing a charge switch that is coupled between said battery charger and a battery cell of said battery pack.

14. The system of claim 13 wherein said charge switch passes a charger voltage from said battery charger to a charger input of said charge pump, said charge pump responsively generating a charge pump output voltage at a pre-determined voltage level to a charger regulator that filters said charge pump output voltage, said charger regulator then generating said internal controller power supply so that a CPU of said battery controller may begin executing battery controller instructions to control operations of said battery pack.

15. The system of claim 14 wherein said CPU closes a discharge switch in said battery pack to begin charging said battery cell, said CPU also utilizing a CPSEL line to switch from said charger input of said charge pump to a battery input of said charge pump, said charge pump responsively generating said charge pump output voltage at said pre-determined voltage level to said charger regulator, said charger regulator filtering said charge pump output voltage to provide said internal controller power supply for said battery controller, said charge pump thus compensating for a reduced battery output voltage resulting from said single-cell implementation of said battery pack.

16. The system of claim 15 wherein said battery pack utilizes said battery charger under control of said battery controller to charge said battery cell, said battery charger being subsequently disconnected for more a unrestricted use of said electronic device, said electronic device utilizing said battery pack to supply said operating power.

17. The system of claim 1 wherein an analog-to-digital converter module of said battery controller monitors a battery voltage of said battery pack as it discharges while supplying said operating power to said electronic device, a CPU of said battery controller controlling a shutdown procedure for said battery pack when a pre-determined discharged voltage level is sensed by said analog-to-digital converter module, said CPU responsively opening a discharge switch in said battery pack.

18. The system of claim 17 wherein said CPU toggles a CPSEL line to switch from a battery voltage of said battery pack at a battery input of said charge pump to a charger voltage from said battery charger at a charger input of said charge pump to thereby generate said internal controller power supply, said internal controller power supply responsively descending below a reset threshold if said battery charger is not connected to said battery pack, said battery pack then entering a shutdown state until said battery charger is connected to said battery pack and a startup procedure is performed by said battery controller to charge said battery pack.

19. The system of claim 1 wherein said battery controller includes a UART device that is implemented to communicate with said electronic device via a single transmit/receive pin on an integrated circuit device that contains said battery controller, said UART thus supporting a single-pin UART interface to conserve available connection pins on said integrated circuit device of said battery controller.

20. The system of claim 19 wherein said UART device receives a timebase signal from a precision instruction oscillator that is implemented on an integrated circuit that includes said battery controller, said instruction oscillator accurately generating a UART clock signal to said UART for synchronizing UART operations.

21. A method for effectively managing operating power for an electronic device, comprising the steps of:

supplying said operating power for said electronic device from a battery pack coupled to said electronic device; and

managing said battery pack alternately in one of a single-cell implementation and a dual-cell implementation by utilizing a battery controller that includes a charge pump to provide an internal controller power supply for operating said battery controller in said single-cell implementation.

22. The method of claim 21 wherein said battery controller is implemented as a single integrated circuit device that is selectively configurable to operate in either said single-cell implementation or said dual-cell implementation of said battery pack.

23. The method of claim 21 wherein said electronic device is implemented as a portable electronic camera device that obtains said operating power from said battery pack, said battery controller providing remaining operating power information regarding said battery pack to said portable electronic camera device.

24. The method of claim 21 wherein said single-cell implementation of said battery pack utilizes a single lithium-ion battery cell, and wherein said dual-cell implementation of said battery pack utilizes two lithium-ion battery cells.

25. The method of claim 21 wherein said battery pack provides a reduced supply voltage to said battery controller in said single-cell implementation, said charge pump responsively increasing said reduced supply voltage in said single-cell implementation to thereby produce said internal controller power supply for powering said battery controller, said internal controller power supply thus being approximately equal in both said single-cell implementation and said dual-cell implementation, said charge pump selectably manipulating said reduced supply voltage by either a unity amplification factor, a 1.5 amplification factor, or times-two amplification factor, depending upon how much said reduced supply voltage needs to be increased to adequately provide said internal controller power supply.

26. The method of claim 21 wherein said battery pack has zero microamps of leakage current in a shutdown mode in which said battery pack has been discharged to a pre-determined threshold voltage level.

27. The method of claim 21 wherein said battery pack includes a charge switch and a discharge switch that are connected in a series configuration between a battery charger and one or more battery cells of said battery pack, said charge switch being opened by a CPU of said battery controller to prevent an overcharge condition in said battery cells.

28. The method of claim 21 wherein said battery pack includes a charge switch and a discharge switch that are connected in a series configuration between a battery charger and one or more battery cells of said battery pack, said discharge switch being openable by a CPU of said battery controller to prevent an overdischarge condition in said battery cells.

29. The method of claim 21 wherein said battery pack includes a charge switch and a discharge switch that are connected in a series configuration between a battery charger and one or more battery cells of said battery pack, said battery controller including an internal negative charge pump that generates a negative charge pump output voltage to a charge amplifier and a discharge amplifier that may then each generate a sufficient enhancement voltage to fully turn on a corresponding one of said charge switch and said discharge switch.

30. The method of claim 29 wherein said internal negative charge pump includes a first phase-1 switch and a second phase-1 switch that are closed to charge a capacitor with a charge pump output voltage from said charge pump, said internal negative charge pump subsequently closing a first phase-0 switch and a second phase-0 switch to provide said negative charge pump output voltage from said internal negative charge pump to both said charge amplifier and said discharge amplifier.

31. The method of claim 21 wherein said battery pack includes a charge switch and a discharge switch that are connected in a series configuration between a battery charger and one or more battery cells of said battery pack, said charge switch and said discharge switch being implemented as P-channel field-effect transistors that are located in a positive charge path between said battery charger and said one or more battery cells of said battery pack.

32. The method of claim 21 wherein said battery pack includes a charge switch and a discharge switch that are connected in a series configuration between a battery charger and one or more battery cells of said battery pack, said charge switch and said discharge switch being implemented as N-channel field-effect transistors that are located in a negative charge path between said battery charger and said one or more battery cells of said battery pack.

33. The method of claim 21 wherein said battery pack is implemented in said single-cell implementation, said battery controller coordinating a startup procedure for said battery pack during which a battery charger is connected to said battery pack in a discharged state, said battery controller responsively closing a charge switch that is coupled between said battery charger and a battery cell of said battery pack.

34. The method of claim 33 wherein said charge switch passes a charger voltage from said battery charger to a charger input of said charge pump, said charge pump responsively generating a charge pump output voltage at a pre-determined voltage level to a charger regulator that filters said charge pump output voltage, said charger regulator then generating said internal controller power supply so that a CPU of said battery controller may begin executing battery controller instructions to control operations of said battery pack.

35. The method of claim 34 wherein said CPU closes a discharge switch in said battery pack to begin charging said battery cell, said CPU also utilizing a CPSEL line to switch from said charger input of said charge pump to a battery input of said charge pump, said charge pump responsively generating said charge pump output voltage at said pre-determined voltage level to said charger regulator, said charger regulator filtering said charge pump output voltage to provide said internal controller power supply for said battery controller, said charge pump thus compensating for a reduced battery output voltage resulting from said single-cell implementation of said battery pack.

36. The method of claim 35 wherein said battery pack utilizes said battery charger under control of said battery controller to charge said battery cell, said battery charger being subsequently disconnected for more a unrestricted use of said electronic device, said electronic device utilizing said battery pack to supply said operating power.

37. The method of claim 21 wherein an analog-to-digital converter module of said battery controller monitors a battery voltage of said battery pack as it discharges while supplying said operating power to said electronic device, a CPU of said battery controller controlling a shutdown procedure for said battery pack when a pre-determined discharged voltage level is sensed by said analog-to-digital converter module, said CPU responsively opening a discharge switch in said battery pack.

38. The method of claim 37 wherein said CPU toggles a CPSEL line to switch from a battery voltage of said battery pack at a battery input of said charge pump to a charger voltage from said battery charger at a charger input of said charge pump to thereby generate said internal controller power supply, said internal controller power supply responsively descending below a reset threshold if said battery charger is not connected to said battery pack, said battery pack then entering a shutdown state until said battery charger is connected to said battery pack and a startup procedure is performed by said battery controller to charge said battery pack.

39. The method of claim 21 wherein said battery controller includes a UART device that is implemented to communicate with said electronic device via a single transmit/receive pin on an integrated circuit device that contains said battery controller, said UART thus supporting a single-pin UART interface to conserve available connection pins on said integrated circuit device of said battery controller.

40. The method of claim 39 wherein said UART device receives a timebase signal from a precision instruction oscillator that is implemented on an integrated circuit that includes said battery controller, said instruction oscillator accurately generating a UART clock signal to said UART for synchronizing UART operations.

41. A system for effectively managing operating power for an electronic device, comprising:

a battery pack coupled to said electronic device for supplying said operating power to said electronic device; and

a battery controller configured to alternately manage said battery pack in one of a reduced-cell implementation and an increased-cell implementation, said battery controller including a charge pump to provide an internal controller power supply for operating said battery controller in said reduced-cell implementation.

42. A system for effectively managing operating power for an electronic device, comprising:

means for supplying said operating power for said electronic device; and

means for alternately managing said battery pack in one of a single-cell implementation and a dual-cell implementation, said means for managing including a charge pump to provide an internal controller power supply for operating said means for managing in said single-cell implementation.